

GRACE

Construction Products Division

PERSONAL AND CONFIDENTIAL

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C. N. Graf

May 24, 1977

From: E. S. Wood

Subj: Tremolite in Vermiculite

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The purpose of this memorandum is to discuss in some detail the nature of the tremolite problem as it impacts our vermiculite business, and also to outline our plans for dealing with the problem. These plans are based on extensive product testing, analysis of alternative configurations of the Zonolite business, and consultation with legal counsel, including the Corporate Legal Division.

THE PROBLEM

Tremolite is present as a tramp mineral in our vermiculite deposits, and while most of it is separated from the vermiculite in the milling process, small amounts are carried to expanding plants and ultimately into finished products. Tremolite is classified as asbestos and regulated by the Environmental Protection Agency (EPA), the Occupational Safety and Health Administration (OSHA), the Mining Enforcement and

EXHIBIT

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Safety Administration (HESA), the Consumer Product Safety Act (CPSA), and the Toxic Substances Control Act (TSCA) as a carcinogen. Although we have been working since 1971 to reduce tremolite in our product, in our expanding plants, and in our mills, we have felt until now that tremolite was misclassified by OSHA and others as a form of asbestos. This was based on our understanding of the difference in physical characteristics of tremolite compared to other fibrous forms of commercial asbestos, as well as outside studies such as the animal study sponsored by Johnson & Johnson on a tremolite talc which showed no carcinogenicity.

Two recent developments have changed our views on this subject. First, an in-house study of mortality rates among ex-employees at Libby indicates that their risk of lung cancer is five times the national average. In this connection, we have experienced asbestosis in 41.5% of the workers (with over 10 years' service) in Libby, as well as in 28% of the workers (with over 10 years' service) exposed to Libby ore in the expanding plants. (The experience at Libby is confused because all of the aforementioned workers were exposed to high dust count levels in the old dry mill. The present Libby dust environment with the new mill represents a major change in this respect. Fiber counts have dropped from a level of above 30 f/ml on the average to a level below 5 f/ml. Also, the expanding plant employees mentioned have also been exposed to commercial asbestos in the manufacture of MK for a number of years.) Secondly, with respect to national safety regulations, the prior distinctions between "commercial asbestos" and "non-commercial asbestos" (trap contaminants) are being erased as the general nature of the hazard of exposure to fibrous materials is more thoroughly studied.

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A great deal of controversy exists over what constitutes a safe level of exposure to a carcinogen. Most people would agree that safe levels are very difficult to establish. One view, taken by most regulating agencies, is that since no safe level can be unequivocally demonstrated, carcinogens must be eliminated where there are acceptable substitutes. Where the carcinogen cannot be eliminated by substitution, exposure must be controlled at the lowest level which can be technically achieved and reliably monitored. The opposing group makes a strong case that no unusual health risks have been rigorously documented for asbestos exposures below 5 f/ml (8-hour time weighted average), much less the present standard of 2 f/ml, or proposed standard of .5 f/ml. In the presence of such controversy it is difficult to determine what posture is appropriate for us in establishing limits of exposure for our employees and customers. A more detailed discussion of the health hazards associated with asbestos exposure is contained in Appendix I.

The exposure problems that we have seen to date are limited to the fibrous type of tremolite that occurs in the Libby deposits. The tremolite associated with our deposits in and around Enoree, South Carolina is largely non-fibrous. Since we have no evidence of asbestosis or other excess health risk associated with asbestos exposure among employees working in South Carolina, we do not believe that the levels of exposure to our employees or customers utilizing material from South Carolina creates a health hazard of any kind. In the case of material from Libby, we believe that lower levels of exposure are required to assure the safety and well-being of our employees. Moreover, regulations already proposed, when put into effect, will mandate lower levels.

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